## CERCLA Proposed Plan for Operable Unit 6

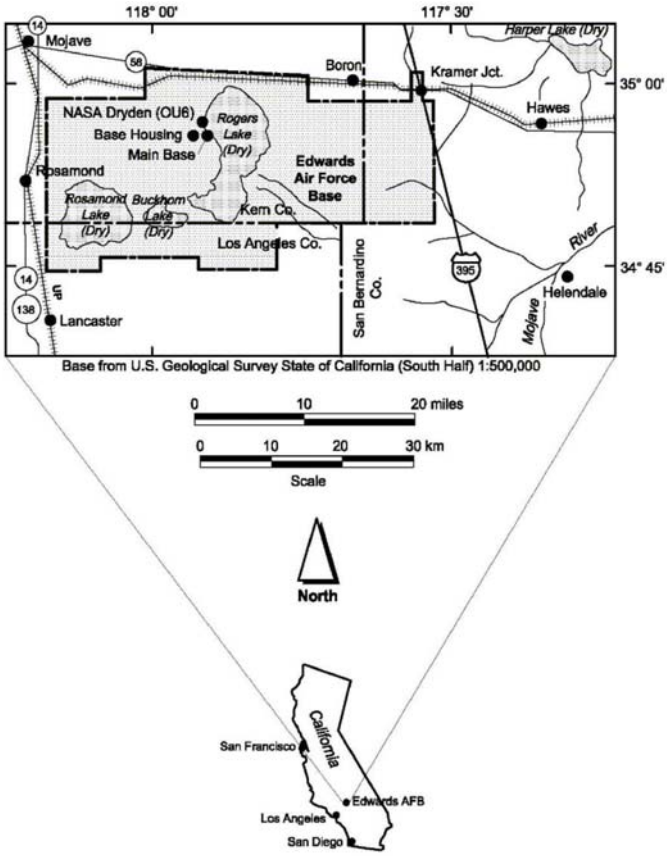
# Air Force Plans Groundwater Cleanup and No Action for Soils at NASA Dryden Sites

**April 2005**

Air Force and NASA environmental managers want people to comment on the proposed cleanup plan for contamination located in the soil and groundwater below the NASA Dryden Flight Research Center at Edwards Air Force Base (AFB). The Base cleanup program calls the NASA Dryden Flight Research Center Operable Unit 6, or OU6.

This Proposed Plan identifies the Preferred Alternative for addressing the contaminated soil and groundwater at OU6. It also summarizes other cleanup alternatives evaluated for use at OU6. This Plan is being issued as required by the public participation requirements in the National Contingency Plan (The Superfund regulation) Section 40 CFR 300.430(f)(2). This Proposed Plan summarizes information found in the Remedial Investigation and Feasibility Study and other documents found in the Administrative Record for OU6.

The Air Force and NASA Dryden managers are working with other agencies to clean up this Operable Unit. They are the US Environmental Protection Agency (EPA), the California State Department of Toxic Substances Control (DTSC) and the California




## Share Your Opinions

Your input helps the Air Force and NASA choose the best way to deal with the contamination. You may fill out a comment form, e-mail or fax your comments to the Air Force. The contact information is on page 9 of this document and the comment form is on page 11. Your comments must be postmarked by the last day in the comment period:

**Public comment period: April 1, 2005 – June 1, 2005**

You may also share your views by attending a meeting or availability session. The Air Force is holding an availability session/public meeting on **April 27, 2005** from 6 to 8 p.m. at the California City Hall, 21000 Hacienda Blvd., California City, Calif. There will also be an availability session held at NASA Dryden for workers.

During these sessions you can meet the cleanup team, ask questions, and view maps of the project. The Air Force and NASA will give a presentation to explain their plan for cleaning up the contamination. They will also answer your questions and give you a chance to speak for the public record. Written comments will be accepted at the meetings.

Regional Water Quality Control Board (CRWQCB), Lahontan Region. The Air Force will review the public comments submitted during the 60-day period, and will consult with the US EPA and California regulators to determine whether or not to modify the Preferred Alternative or select another remedy. Then the Air Force, US EPA, and California regulators will jointly select the remedy for OU6.

Edwards AFB was listed on US EPA's National Priorities List (NPL) on August 30, 1990 (the NPL is EPA's list of the most contaminated sites). Shortly afterward, Edwards AFB entered into a Federal Facility Agreement (FFA) with EPA Region IX, the DTSC and the CRWQCB. The FFA provides for involving federal and state regulators in developing and implementing cleanup decisions.

## Site Background - Where the Contamination Is and How It Got There

The NASA Dryden Flight Research Center began operations in 1946. The underground contamination at NASA Dryden is made up of fuels and solvents related to aircraft work at the site in the past. Air Force and NASA workers started looking for contamination in 1987. They first looked at 19 places where they knew hazardous materials had been used or stored.

Workers drilled to collect soil and water samples. These samples were sent to off-base laboratories to see what chemicals were present.

The samples pointed the cleanup team to six spots where the amounts of soil and/or groundwater contamination were highest. The results of the sample tests came back and chemicals that the government considers dangerous to people are listed in the tables below and on page 3.

The five spots with soil contamination are called Site N1, Site N2, Site N3, Site N4, and Site N7. Area of Concern N14 showed no soil contamination. Groundwater is also contaminated at Site N2, Site N3, and Site N7. The regulatory agencies agreed that the other 13 areas were not dangerous.

Site N1 is a retention pond. This is an area where rainwater runoff collects from the north part of the NASA Dryden area. Chemicals spilled on asphalt or concrete may have moved to Site N1 with the rainwater. The area is still used today, so this site will be managed by the Base's compliance program.

Site N2 is a drainage area where waste from an Auxiliary Power Unit was dumped many years ago. It also collected rainwater that ran off the concrete from an aircraft run-up area. Concrete pits at the site were also used to mix water with hydrogen peroxide to make it less dangerous for workers.

**Contaminants of Concern in Soil at NASA Dryden**

| Soil Sites | Contaminant(s) Causing the Most Risk | Possible Health Risk |
|---|---|---|
| N1 | Benzo(a)pyrene | A cancer risk of $3.1 \times 10^{-5}$ - which means about 3 additional cases of cancer for 100,000 people exposed.<br>A noncancer hazard of 1.46 – A Hazard Index above 1 is considered unsafe. |
| N2 | Benzo(a)pyrene<br>Organic lead | A cancer risk of $3.0 \times 10^{-6}$ - which means about 3 additional cases of cancer for 1,000,000 people exposed.<br>A noncancer hazard of 83.6 – A Hazard Index above 1 is considered unsafe. |
| N3 | Benzo(a)pyrene<br>Organic lead | A cancer risk of $3.3 \times 10^{-6}$ - which means about 3 additional cases of cancer for 1,000,000 people exposed.<br>A noncancer hazard of 49.2 – A Hazard Index above 1 is considered unsafe. |
| N4 | Benzo(a)pyrene | A cancer risk of $3.2 \times 10^{-6}$ - which means about 3 additional cases of cancer for 1,000,000 people exposed.<br>A noncancer hazard of 0.89 – A Hazard Index above 1 is considered unsafe. |
| N7 | Benzo(a)pyrene | A cancer risk of $3.0 \times 10^{-5}$ - which means about 3 additional cases of cancer for 100,000 people exposed.<br>A noncancer hazard of 0.002 – A Hazard Index above 1 is considered unsafe. |
| N14 | none | -- |

| Contaminants of Concern in Groundwater at NASA Dryden | | | |
|---|---|---|---|
| Contaminant | Highest 2004 Level (µg/L) | MCL (µg/L) | Cancer Causing? |
| 1,2-Dibromoethane | 0.82 | 0.05 | Probable |
| 1,2-DCA | 33 | 0.5 | Possible |
| *cis* -1,2-DCE | 1,300 | 6 | Inconclusive |
| *trans* -1,2-DCE | 16 | 10 | Inconclusive |
| Benzene | 11,000 | 1 | Probable |
| Carbon Tetrachloride | 2,600 | 0.5 | Possible |
| Chloroform | 550 | 100 | Probable |
| Ethylbenzene | 1,100 | 700 | No |
| Methylene Chloride | 100 | 5 | Inconclusive |
| Toluene | 21,000 | 150 | No |
| Total Xylenes | 6,400 | 1,750 | No |
| TCE | 13,000 | 5 | Probable |

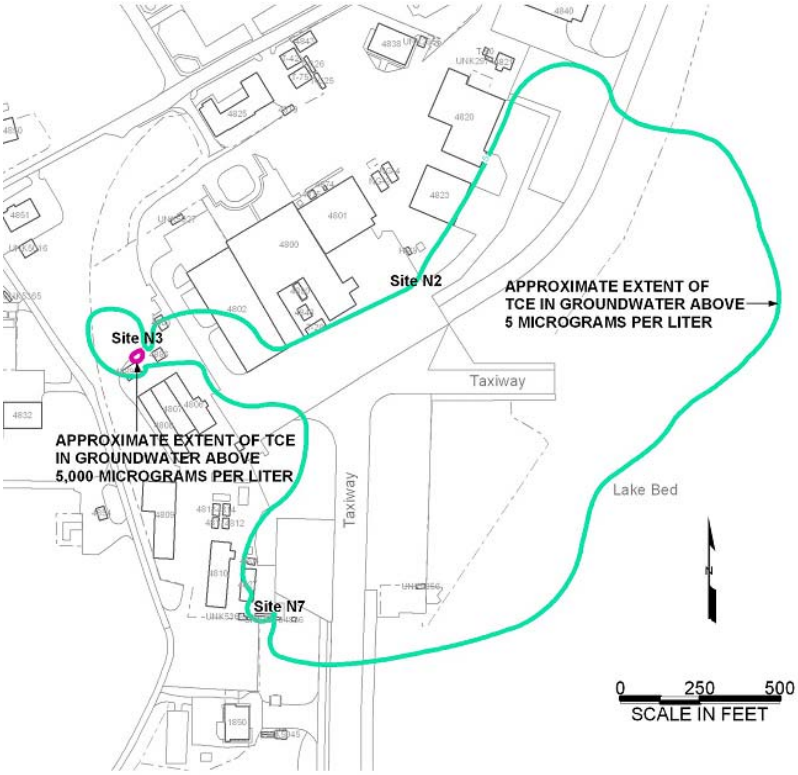
This table shows the chemicals in the groundwater that are higher than the safe limits set in the Safe Drinking Water Act. Although people do not drink this water, the numbers from the Safe Drinking Water Act guide us in cleaning up contamination. The Safe Drinking Water Act calls their limits Maximum Contaminant Levels, or MCLs in the table. The symbol µg/L means micrograms per liter, approximately the same as parts per billion. It is the unit of measure used to track contamination in groundwater. One microgram per liter is equal to 1 part contamination and 999,999,999 parts water.

Site N3 used to be a gas station. Three underground fuel tanks may have leaked. The tanks have been removed. There is also a ditch that may have collected chemicals leaking from drums sitting on the dirt.

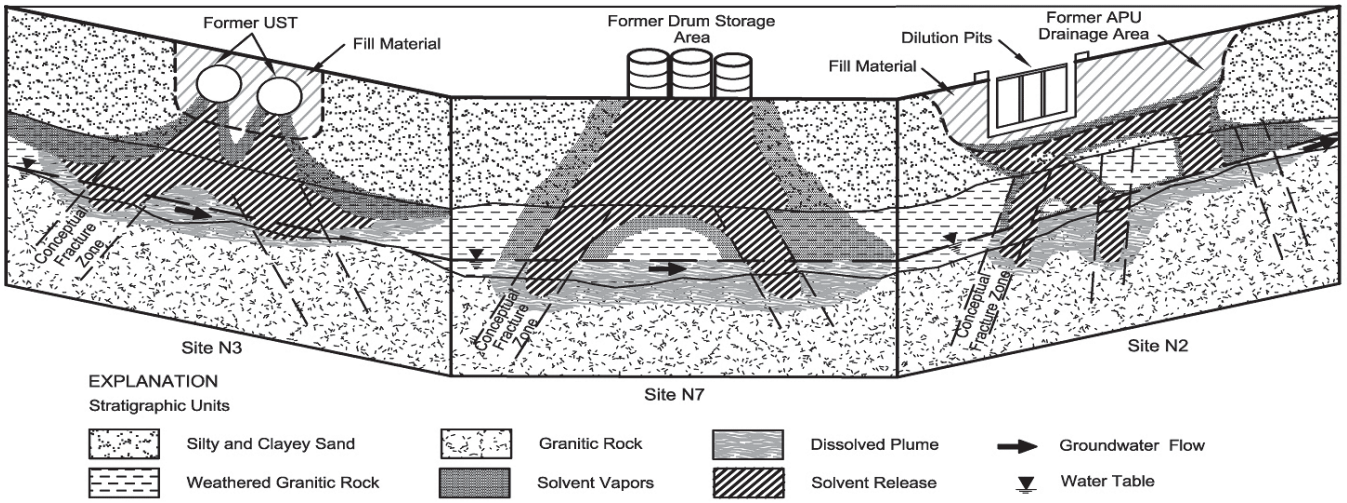
Site N4 is also a retention pond. It collects rainwater from the south part of the NASA Dryden area. It also had a wash rack. This wash rack was originally used to work with alcohol fuels and hydrogen peroxide in the 1950's. Later it was used to steam clean aircraft and equipment. Contamination could have drained through cracks in the pavement into the soil. However, the US EPA, California regulators and the Air Force believe the chemicals found in the soil are most likely from asphalt fragments broken off from the pavement during sampling.

Site N7 was used to store hazardous materials and hazardous wastes in steel drums. The drums leaked.

Area of Concern N14 is the area where Space Shuttle fuels were stored on top of concrete. Samples at the site don't show any contamination in the soil underneath the concrete.




Groundwater Sites N2, N3 and N7 are located on the lakebed side of the NASA Dryden Flight Research Center. Linking the three is an underground puddle of contamination, known as a plume. The plume's outside edges are shown with a green line.




**Side view of the three groundwater sites**

The Air Force proposes No Action for soils at Sites N1, N2, N3, N4, N7 and Area of Concern N14. The reason for this recommendation is primarily due to the low risk to human health and the environment.

## Human Health Risk

As part of the Remedial Investigation, the Air Force calculated the risk that the soils at Sites N1, N2, N3, N4, and N7 would pose if people were exposed to them. The risk assessment was based on very conservative assumptions (for example, the assumption that someone would be working at the site for 25 years). This risk is then represented by the number of additional cases of cancer per 1,000,000 people that may occur if people were exposed to the contaminated soil.

To manage these types of risks, the US EPA has developed the following ranges: greater than one additional cancer case in 10,000 is unacceptable; one additional cancer case in 10,000 up to 100,000 is considered generally acceptable; and one additional cancer case in 100,000 up to 1,000,000 people is considered acceptable.

As shown on the table on page 2, the risk assessment results show that risks for these sites fall within the "generally acceptable" and "acceptable" ranges. A Hazard Index is the numerical expression of health effects from noncancer causing chemicals. An index of greater than "1" is considered unsafe.

The Hazard Index for Site N1 is barely above 1 and the Hazard Indexes for Sites N4 and N7 are below 1. The Hazard Indexes for Sites N2 and N3 are high. However, the noncancer hazard at these two sites is due to the detection of organic lead. The organic lead detections are considered uncertain because the concentrations were low, barely above what laboratory instruments could detect. The Air Force, US EPA, and the State agree that, due to the low cancer and noncancer risks, the low risk of exposure due to the site being paved, as well as the extremely conservative nature of the risk assessment process, No Action for soil is necessary for these sites.

No groundwater contaminant sources were identified in the soil. The National Contingency Plan establishes an expectation that treatment will be used to address principal threats posed by the sites wherever practicable. Because no source materials were identified at NASA Dryden, no principal threat wastes were targeted for cleanup at NASA Dryden.

***However,*** the groundwater at Sites N2, N3, and N7 will require cleanup. The contaminated groundwater under NASA Dryden is not used for drinking by anyone. Even though the groundwater is not a current drinking water source, it is classified as a "potential drinking water source" by the State.

For that reason, the three remaining sites, which were identified as sources of an underground puddle of contamination, or plume, require treatment. The groundwater is very close to the ground surface, sometimes as close as 10 feet underground. The nearest drinking water wells are at North Base, several miles north and much deeper.

The plume stretches about 1,800 feet east of Site N3, and is about 10 feet under the ground surface. This plume consists mostly of the solvent trichloroethene (TCE).

The groundwater below NASA Dryden occurs within cracks or fractures in underground rock or bedrock. Groundwater contamination in bedrock is hard to clean up.

## No Risk to Wildlife

Technical experts did risk assessments at NASA Dryden. Some risks to wildlife were found at parts of NASA Dryden. However, the industrial nature of NASA Dryden makes for poor wildlife habitat and no threatened or endangered plants or animals live in the NASA Dryden area.

## No Risk to NASA Workers

Although the contamination is there, *it is not a risk to the average NASA worker*. For contamination to harm people, three things must happen.

1. First, there must be enough of the contamination to do harm.
2. Second, there must be people at the site.
3. Third, the people at the site need to come into contact with the contamination. This can be through touching, eating, drinking or breathing it in.

The contamination in the NASA Dryden groundwater is about 10 feet underground. Likewise, the contamination in soils at NASA Dryden is located under asphalt. So, a person doing normal aircraft work on the asphalt or concrete on the surface would not be able to touch, eat, drink, or breathe it in. However, people digging under the asphalt may have to take special precautions to protect themselves from the contamination.

## Cleanup Goals

The cleanup team has put together several goals or remedial action objectives for cleaning up the groundwater. The overall remedial action objective is to reduce, to acceptable levels, the risk associated with contaminants identified during the Remedial Investigation. This goal includes:

- Protecting people's health by preventing exposure to groundwater contaminants that pose an unacceptable cancer risk as defined by the US EPA.
- Protecting people's health by preventing exposure to groundwater contaminants that are above regulatory limits.
- Protecting the environment by preventing exposure of plants and animals to site contaminants.

## Cleanup Options

Base workers are looking at five different ways to manage and cleanup the contaminated groundwater to protect people, wildlife, and the future use of the groundwater. The cleanup team compared each alternative against the nine criteria required by law. The Feasibility Study completed in August 2004 provides more detail. The five possible alternatives are:

1. **Land use controls** – The Air Force and NASA already restrict access to the sites except for workers. All projects on base require approval for construction or digging in the soil. The project managers at Edwards AFB have access to the Edwards AFB Geographic Information System. This system shows which areas of the Base are contaminated, and therefore should not be disturbed without proper protection (or used for such uses as residential uses, day-care centers and other inappropriate uses).

   The Air Force will be responsible for implementing, monitoring and enforcing the land use controls. If it is later determined that someone has taken action at the site that is inconsistent with the land use controls, the Air Force will take action as soon as practicable to address the situation. In addition, the Air Force will notify the EPA and California regulators as soon as practicable after discovering the breach (not to exceed 10 days). The Air Force will give the EPA and the California regulators advance notice prior to transferring property subject to land use controls. The Air Force will not modify or terminate land use controls without approval by the EPA and California regulators.

   Monitoring of the land use controls will be conducted annually or less frequently as to be determined based on site conditions. Though this

alternative does not include active treatment, the natural movement of the groundwater may someday dilute the contamination to a level that is safe. This will take longer than 10 years. This alternative will cost $126,000 over 30 years.

2. **Groundwater monitoring/hydrologic control with land use controls** – This alternative is the first alternative with some extra steps. The extra steps would include taking groundwater samples every year to see if the contamination is moving. Other details of this alternative will be worked out in the next stage of the cleanup, called Remedial Design. Like the first alternative, this alternative does not include active treatment but the natural movement of the groundwater may someday dilute the contamination to a level that is safe. This will take longer than 10 years. It will cost $1.34 million.
3. **Chemical oxidation with land use controls** – With this alternative, cleanup workers would inject chemicals into the ground that would mix with the contamination and turn it into harmless byproducts. Two different chemicals, Fenton's reagent and permanganate, have already worked in tests at NASA Dryden. Workers would drill 2,550 wells to inject the chemicals. This alternative would take about 3 years and cost $71.5 million.
4. **Source control and hydrologic control with groundwater monitoring and land use control** – This alternative is a mix of the first three. The only areas where permanganate would be injected are where the groundwater is most contaminated, called source areas. The rest of the contamination would someday be diluted to safe levels. Twenty-three, existing wells would be used to inject the permanganate. It will take more than 10 years to clean the groundwater. This alternative would cost $1.91 million.
5. **No action** – This alternative is only listed to compare to the others. Nothing would be done at NASA Dryden. Under this alternative, the contamination would remain in place. This alternative would cost nothing.

## Comparing the Alternatives to Cleanup Requirements

The Air Force looks at nine criteria established by the US EPA when choosing a way to clean up a contaminated site. The five alternatives previously mentioned are compared against the nine criteria in the table on page 8.

1. **Overall Protection of Human Health and the Environment** - This criterion is used to evaluate the ability of an alternative to eliminate, reduce, or control the risks associated with contaminants and exposure pathways. No significant risk to people and wildlife exists at NASA Dryden. All of the alternatives are protective of human health and the environment by maintaining the current incomplete exposure pathways.

   Although land use controls were not assumed to be an active component of Alternative 5, the land use as a secured, military facility, inherently restricts access to unauthorized personnel and, thus, is protective of all but workers performing intrusive activities. Protection verification mechanisms (i.e., groundwater monitoring) are included in Alternatives 2, 3, and 4, though no such mechanisms exist in Alternatives 1 and 5. Alternatives 1, 2, 3 and 4 include land use controls to prevent human exposure to contaminants. No plume migration is anticipated and no beneficial uses are threatened.
2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) -** This criterion is used to evaluate the potential for an alternative to comply with ARARs. Alternatives 1, 2, and 5 may not comply with ARARs (if natural processes do not degrade contaminant concentrations to below regulatory limits or maximum contaminant levels [MCLs]) and Alternatives 1 and 5 provide no compliance verification mechanisms. Alternative 3 achieves compliance with MCLs in groundwater and, thus, with ARARs within 3 years. Alternative 4 would comply with ARARs over an extended timeframe.

3. **Long-Term Effectiveness and Permanence** - This criterion is used to evaluate the ability of an alternative to protect human health and the environment after the remedial action is complete. Alternatives 1, 2, and 5 may provide long-term effectiveness due to the current lack of risk to human health or the environment. Alternative 5 may not be protective of workers performing intrusive activities. Alternatives 3 and 4 provide long-term protection verification mechanisms to verify permanence of the approach while Alternatives 1 and 5 do not provide such mechanisms.

   Any effectiveness related to Alternatives 1, 2, and 5 (which would likely be limited) may be attributable to natural processes present at NASA Dryden and reduction of contaminant concentrations to below MCLs is unlikely, even over an extended timeframe. Alternative 3 would attain long-term effectiveness and permanence by reducing contaminant concentrations to below MCLs. Alternative 4 would provide long-term effectiveness and permanence by reducing contaminant concentrations to below MCLs within the treated areas. Reduction of contaminant concentrations beyond the treated areas may occur over an extended timeframe. All of the alternatives would provide a high degree of reliability.

4. **Reduction of Toxicity, Mobility, or Volume Through Treatment** - This criterion is used to evaluate the ability of an alternative to eliminate or significantly reduce the toxicity, mobility, or volume of contaminants. Only Alternatives 3 and 4 use treatment processes to reduce contaminant toxicity and volume through treatment. Alternatives 1, 2, and 5 rely on natural processes, and Alternative 4 relies on natural processes following treatment.

5. **Cost -** Cost considerations include capital costs and present value costs. Capital costs are the costs associated with the implementation of an alternative. These include direct costs (equipment, labor, and materials for remedial action implementation) and indirect costs (engineering and other costs not directly associated with construction). Present value costs are used for comparative analysis. Alternative 5 has the lowest estimated present value cost ($0) and Alternative 3 has the highest present value cost ($71,500,000). Although Alternative 4, costs more than Alternatives 1, 2, and 5, it is cost effective because it treats the highest contaminant concentration areas. While Alternative 3 provides a shorter cleanup time-frame than Alternative 4, the present value cost of Alternative 3, is approximately 37 times higher than the present value cost of Alternative 4.

6. **Short-Term Effectiveness -** This criterion is used to evaluate the protectiveness of human health and the environment during the construction and implementation of an alternative. Precautions would be taken during well construction under Alternatives 2, 3, and 4 to eliminate any risk to people from soil drilling activities. Short-term risk to workers associated with normal construction hazards and potential contact with contaminated water will be eliminated through appropriate controls and adherence to proper health and safety procedures. Alternatives 1 and 5 would require no construction period and the construction time required for Alternative 3 would be longer than Alternatives 2 and 4 due to the extremely high number of wells to be installed and injections to be performed. Alternative 1 has no risks associated with implementation and requires little or no implementation time.

7. **Implementability** - This criterion is used to evaluate the technical feasibility, administrative feasibility, and availability of services and materials. Technical feasibility is the level of difficulty to implement an alternative at NASA Dryden, the reliability of the technology or technologies associated with the alternative, unknowns associated with the alternative, and the need for studies. Administrative feasibility is the regulatory agency concurrence, the need for permits or waivers, and the need for land use restrictions. Availability of services and materials is the mobilization requirements, accessibility to equipment, availability of materials, and availability of trained personnel required to implement the alternative. Alternative 2 uses conventional equipment and methods for groundwater sampling, analysis, reporting, and

# Cleanup Criteria and NASA Dryden Cleanup Alternatives

| CERCLA Criteria | Alternatives 1 Land Use Controls (LUCs) | 2 Groundwater Monitoring/ Hydrologic Control with LUCs | 3 Chemical Oxidation with LUCs | 4 Source Control and Hydrologic Control with Groundwater Monitoring and LUCs | 5 No Action |
|---|---|---|---|---|---|
| 1. **Overall Protection of Human Health and the Environment** Addresses whether a remedy provides adequate protection of human health and the environment and describes how risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls. | YES | YES | YES | YES | NO |
| **2. Compliance with Applicable or Relevant and Appropriate** Addresses whether a remedy will meet all ARARs for federal and state environmental statutes or provide grounds for invoking a waiver. | May not, if natural processes do not degrade the contaminant. | May not, if natural processes do not degrade the contaminant. | YES, within 3 years. | YES, within an extended timeframe. | May not, if natural processes do not degrade the contaminant. |
| **3. Long-term Effectiveness** Refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. | YES, but long-term reduction to safe levels is unlikely. | YES, but long-term reduction to safe levels is unlikely. | YES, with long-term verification mechanisms. | YES, with long-term verification mechanisms. | YES, but long-term reduction to safe levels is unlikely. |
| **4. Reduction of Toxicity, Mobility, and** Refers to the ability of a remedy to reduce the toxicity, mobility, and volume of the hazardous components present at the site. | No | No | Using treatment processes | Using treatment processes | No |
| **5. Cost** | | | | | |
| Estimated Capital Cost | $2,800 | $160,000 | $43.9 Million | $464,000 | $0 |
| Estimated Operations & Maintenance Cost | $82,400 | $1.54 Million | $28.2 Million | $1.89 Million | |
| Estimated Present Value | $126,000 | $1.34 Million | $71.5 Million | $1.91Million | |
| **6. Short-term Effectiveness** Addresses the period of time needed to complete the remedy, and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until the cleanup goals are achieved. | No construction - no risk to workers. | Precautions to protect public during soil drilling. | Precautions to protect public during soil drilling, longer construction time. | Precautions to protect public during soil drilling. | No construction - no risk to workers. |
| Time to Construct | None | 1day | 3 months | 1day | -- |
| Time to Meet Cleanup Goals | >10 years | >10 years | 3 years | >10 years | -- |
| **7. Implementability** Refers to the technical and administrative feasibility of a remedy, including the availability of materials and services needed to carry out a particular option. | No construction permits. | Uses conventional equipment/methods for groundwater work. | May be difficult to disperse oxidizers in fractured bedrock; wells could impact mission. | May be difficult to disperse oxidizers in fractured bedrock. | No construction permits. |
| **8. State/Support Agency Acceptance** Indicates whether, based on its review of the information, the state concurs with, opposes or has no comment on the preferred alternative. | | | | YES | |
| **9. Community Acceptance** Indicates whether community concerns are addressed by the remedy and whether the community has a preference for a remedy. Although public comment is an important part of the final decision, the Air Force is compelled by law to balance community concerns with all of the criteria. | Evaluated after the public comment period ends. | Evaluated after the public comment period ends. | Evaluated after the public comment period ends. | Evaluated after the public comment period ends. | Evaluated after the public comment period ends. |

waste disposal. Alternatives 3 and 4 may present difficulty in achieving dispersion of oxidizing agents in fractured bedrock. That difficulty may be mitigated during the implementation of Alternative 3 with the installation of closely spaced wells. Success of the treatment under Alternative 3 relies partially on the well placement and injection in roadways and taxiways. Such an implementation would compromise mission-critical activities by limiting aircraft movement. Alternatives 1 and 5 are easily implemented since they involve no construction activities or related permits. Although Alternatives 2 and 4 require well construction, the level of effort is far less than Alternative 3. All alternatives have few associated administrative difficulties.

8. **State/Support Agency Acceptance** - This criterion is used to address technical and administrative concerns that the agencies may raise during the review process. The US EPA as well as the California regulators support Alternative 4.
9. **Community Acceptance** - This criterion is used to evaluate the concerns that the public may have and the anticipated level of acceptance by the public. Community acceptance of the Preferred Alternative will be evaluated after the public comment period ends.

## Alternative 4 is Preferred

The Air Force, NASA, the US EPA, and the California regulators all prefer Alternative 4 for cleaning up the groundwater. The alternative is preferred because it will clean up the contamination and protect people and wildlife. It is also cheaper and will not have as much impact on the NASA mission as Alternative 3.

## No Action for Soil

The Air Force, US EPA and the State agree that No Action for soil is necessary due to the low cancer and noncancer risks, the low risk of exposure due to the site being paved, as well as the extremely conservative nature of the risk assessment process.

## Community Participation

The Air Force provides information regarding the cleanup of NASA Dryden to the public through the Restoration Advisory Board, the Administrative Record file for the site, the Environmental Management website (http://www.edwards.af.mil/penvmng/aboutedwards/EM.html) and the monthly publication ***Report to Stakeholders***.

The Air Force encourages the public to gain a more comprehensive understanding of NASA Dryden and the cleanup activities that were conducted at NASA Dryden. All the documents that the Base has used to make decisions about cleanup at NASA Dryden are in the Base's Administrative Record. To look at the Administrative Record, you must make an appointment with Gary Hatch during regular business hours.

- 95 ABW/PAE
  Attn: Gary Hatch
  5 E. Popson Ave, Bldg. 2650A
  Edwards AFB, CA 93524-8060
- (661) 277-1454
- Fax: (661) 277-6145
- E-mail: gary.hatch@edwards.af.mil
- Hours: By Appointment only, Monday through Friday 8 a.m. to 4:30 p.m.

## To Make A Comment

Comments can be made at the public meetings or you can mail, e-mail or fax your comments on the Operable Unit 6 Proposed Plan to Gary Hatch using the contact information above. A form is provided on page 11, but written comments can be in any form.

## Glossary

**Administrative Record** – A collection of all documents relied upon to select an alternative for a remedial action.

**Chemical oxidation** – The chemical conversion of hazardous contaminants to those of lower toxicity through the use of oxidizing agents such as permanganate, persulfate, Fenton's reagent, and ozone. Can be applied below surface (*in situ*) by injecting oxidizing agents or applied above surface (*ex situ*) by extracting contaminated groundwater.

**Feasibility Study** – A document, prepared for regulatory review, which details the development, screening, and evaluation of alternatives for remediation of a contaminated site.

**How to Get More Information**

If you want more information on the underground contamination at NASA Dryden, you can look at technical books we have available for the public at four locations:

**Edwards AFB Library**
5 West Yeager Boulevard
Building 2665
Edwards AFB, CA 93524-1295
(661) 275-2665

**Kern County Public Library**
Wanda Kirk Branch
3611 West Rosamond Boulevard
Rosamond, CA 93560
(661) 256-3236

**Los Angeles County Public Library**
601 West Lancaster Boulevard
Lancaster, CA 93534
(661) 948-5029

**Twenty Mule Team Museum**
26962 20 Mule Team Road
Boron, CA 93516-1560
(760) 762-5810

OR you can contact:

**Nicole Moutoux, Project Manager**
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(415) 972-3012
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**John O'Kane, Jr., Project Manager**
DTSC
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**Cindi Mitton, Project Manager**
CRWQCB, Lahontan Region
(760) 241-7413
cmitton@waterboards.ca.gov

**Geographic information system** – A computer system used for the storage and organization of spatially-referenced information.

**Groundwater** – Underground water that fills pores in soils or openings in rocks to the point of saturation. Groundwater is often used as a source of drinking water via municipal or domestic wells.

**Monitoring** – Collection of information about the environment that helps gauge the effectiveness of a cleanup action. At OU6, groundwater wells are used to monitor plume movement and characteristics.

**Principal threat wastes** – Source materials that are considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to people or wildlife should exposure occur.

**Proposed Plan (Plan)** – A document, specifically prepared for public review and comment, that summarizes the feasible remedial alternatives and the preferred alternative identified in a Plan of Action or Feasibility Study.

**Remedial Investigation** – A sampling program including the collection of soil, air, and groundwater samples to determine the types and amounts of contaminants present and the area the contaminants cover. Risk assessments are performed during the Remedial Investigation to determine potential health threats to people and wildlife due to exposure to contaminated soil, air, and groundwater.

**Safe Drinking Water Act maximum contaminant level (MCL)** – The maximum permissible level of a contaminant in water that is delivered to any user of a public water system.

**Source materials** - Materials that contain hazardous substances, pollutants, or contaminants that act as the starting point of contaminant migration to groundwater and may be highly toxic and not readily contained. Although groundwater is not usually considered a source material, non-aqueous phase liquids (NAPLs) in groundwater may be considered such. Source materials and NAPLs have not been identified at NASA Dryden.

## We welcome your comments to the Edwards Air Force Base Operable Unit 6 Proposed Plan

Public input regarding the Proposed Plan for Edwards Air Force Base OU6 is important to the Air Force. Comments provided by the public are valuable in helping the Air Force select a final cleanup remedy for OU6. If you have any questions about the comment period, please contact Gary Hatch of Environmental Public Affairs at (661) 277-1454.

Comments may also be submitted to the Air Force via email at: Gary.Hatch@Edwards.af.mil. Hard copy comments may be mailed to: 95 ABW/PAE, 5 East Popson Avenue, Building 2650A, Edwards AFB, California, 93524-8060, Attention: Gary Hatch. You may add additional pages to this form, as necessary. When you are finished, you can give the form to our staff or mail it.

**Comments must be postmarked by June 1, 2005.**

Name _____ Home Phone _____

Address _____ Work Phone _____

City _____ State _____ Zip _____

**Comment or concern:**

**If you'd like to speak directly with someone about your concern, please contact Gary Hatch, Chief of Environmental Public Affairs, at (661) 277-1454**